

special manner in my researches, but equally, to all the *Araneida*, as I have since convinced myself.

In these Articulata, the heart, usually divided into five chambers, offers four pairs of auriculo-ventricular orifices; the aorta, which springs from the anterior chamber, penetrates into the thorax and furnishes two arteries on each side, the branches of which are distributed to the posterior *diverticula* of the stomach and to the thoracic muscles. Beyond this the aorta divides into two great trunks, which above give off the arteries of the first *diverticula* of the stomach and of all the muscles of the anterior portion of the thorax. The ophthalmic arteries spring from the inner part of each of these trunks. Below, they are prolonged to form the arteries of the mandibles (*antennes pincés*), and about their median portion they furnish a voluminous artery which divides immediately to form the arteries of the legs and of the ventral portion of the abdomen. All these vessels present a number of branches and ramifications not inferior to those which are generally seen in vertebrated animals. Besides these, each of the chambers of the heart furnishes a large artery on each side, the branches of which are distributed to the liver and intestines.

For the return of the blood the circulatory apparatus is much less perfect; in general there only exist canals, the walls of which are incapable of being isolated by dissection. Nevertheless, the legs and the mandibles (*antennes pincés*) are penetrated by a very distinctly limited venous canal; but in the thorax the principal passages are merely circumscribed by the bundles of muscles. On the other hand, in the liver, we observe, at various points and principally on the sides, vestiges of membranous walls.

All the venous blood collected from the different parts of the body is conducted into the lower region of the abdomen, where it is introduced into the respiratory organs, by means of two large pulmonary canals formed by a delicate membrane; arrived at the organs of respiration, the nutritive fluid soon passes into the pulmo-cardiac vessels, which are equal in number to the auriculo-ventricular orifices of the heart, into which they empty themselves. These vessels, of a very delicate consistency, are always adherent to the inner walls of the abdominal teguments.

Thus the circulation of the blood in the Arachnida is executed by means of an arterial system of the most complete description; and a venous system, which, although no doubt very imperfect when compared with that of the Vertebrata, offers, nevertheless, in the regularity of its course and the well-circumscribed limits of most of its passages, a degree of complication of which naturalists hitherto could have formed no idea.—*Comptes Rendus*, March 15, 1852, p. 402.

ON THE DISTRIBUTION OF COLUBER NATRIX.

Referring to Mr. Gray's article in the June Number of the 'Annals of Natural History,' on the distribution of the *Coluber natrix*, I beg to state that it is a mistake to suppose that this reptile is not found in Norfolk. I have seen specimens from two localities in East Norfolk, and I have heard of them in West Norfolk. I have also

heard of them at Fritton in East Suffolk, where I am informed that they are frequently observed in summer to swim across a lake from a quarter to half a mile in breadth*.—JOHN HENRY GURNEY.

Easton, Norfolk, July 5, 1852.

Uses of the Stillingia sebifera, or Tallow Tree, with a notice of the Pe-la, an Insect-wax of China†. By J. D. MACGOWAN, M.D.

The botanical characters of this member of the Euphorbiaceæ are too well known to require description; but hitherto no accurate account has been published of its varied uses, and although it has become a common tree in some parts of India and America, its value is appreciated only in China, where alone its products are properly elaborated. In the American Encyclopædia it is stated that this tree is almost naturalized in the maritime parts of South Carolina, and that its capsules and seeds are crushed together and boiled, the fatty matter being skimmed as it rises, hardening when cool.

Dr. Roxburgh in his excellent 'Flora Indica,' says:—"It is now very common about Calcutta, where, in the course of a few years, it has become one of the most common trees. It is in flower and fruit most parts of the year. In Bengal, it is considered only an ornamental tree; the sebaceous produce of its seeds is not sufficient in quantity, nor its qualities so valuable, as to render it an object worthy of cultivation. It is only in very cold weather that this substance becomes firm; at all other times it is in a thick brownish fluid state, and soon becomes rancid; such is my opinion of the famous vegetable tallow of China."

Dr. Roxburgh was evidently misled in his experiments by pursuing a course similar to that which is described in the 'Encyclopædia Americana' (and in many other works), or he would have formed a very different opinion of this curious material.

Analytical chemistry shows animal tallow to consist of two proximate principles—*stearine* and *elaine*. Now what renders the fruit of this tree peculiarly interesting is the fact that both these principles exist in it separately, in nearly a pure state. By the above-named process, stearine and elaine are obtained in a *mixed* state, and consequently the mass presents the appearance described by Dr. Roxburgh.

Nor is the tree prized merely for the stearine and elaine it yields, though these products constitute its chief value: its leaves are employed as a black dye; its wood being hard and durable may be easily used for printing-blocks and various other articles; and finally, the refuse of the nut is employed as fuel and manure.

The *Stillingia sebifera* is chiefly cultivated in the provinces of Kiangsi, Koungnam, and Chehkiang. In one district, near Haugechan, the inhabitants defray all their taxes with its produce. It grows alike on low alluvial plains and on granite hills, on the rich mould at the

* Two other friends have made the same correction of Mr. F. Edwards's observations.—J. E. GRAY.

† Drawn up for the Agricultural and Horticultural Society of India.